ACC5A

BATTERY OPERATED COUNT TESTER

USER'S MANUAL

HP-253
August 1995

HOFFER FLOW CONTROLS, INC.
The Turbine Flowmeter Company

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Notice

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This manual has been provided as an aid in installing, connecting, calibrating, operating, and servicing this unit. Every precaution for accuracy has been taken in the preparation of this manual; however, HOFFER FLOW CONTROLS, INC. neither assumes responsibility for any omissions or errors that may appear nor assumes liability for any damages that may result from the use of the products in accordance with information contained in the manual.

HOFFER FLOW CONTROLS' policy is to provide a user manual for each item supplied. Therefore, all applicable user manuals should be examined before attempting to install or otherwise connect a number of related subsystems.

During installation, care must be taken to select the correct interconnecting wiring drawing. The choice of an incorrect connection drawing may result in damage to the system and/or one of the components.

Please review the complete model number of each item to be connected and locate the appropriate manual(s) and/or drawing(s). Identify all model numbers exactly before making any connections. A number of options and accessories may be added to the main instrument, which are not shown on the basic user wiring. Consult the appropriate option or accessory user manual before connecting it to the system. In many cases, a system wiring drawing is available and may be requested from HOFFER FLOW CONTROLS.

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RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the Hoffer Flow Controls Customer Service Department, telephone number (252) 331-1997 or 1-800-628-4584. BEFORE RETURNING ANY PRODUCT(S) TO HOFFER FLOW CONTROLS, PURCHASER MUST OBTAIN A RETURNED MATERIAL AUTHORIZATION (RMA) NUMBER FROM HOFFER FLOW CONTROLS' CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned RMA number should then be marked on the outside of the return package and on any correspondence.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting HOFFER FLOW CONTROLS:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS OR **CALIBRATIONS**, consult HOFFER FLOW CONTROLS for current repair/calibration charges. Have the following information available BEFORE contacting HOFFER FLOW CONTROLS:

1. P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

LIMITED WARRANTY

HOFFER FLOW CONTROLS, INC. ("HFC") warrants HFC's products ("goods") described in the specifications incorporated in this manual to be free from defects in material and workmanship under normal use and service, but only if such goods have been properly selected for the service intended, properly installed and properly operated and maintained. This warranty shall extend for a period of (1) year from the date of delivery to the original purchaser (or eighteen (18) months if the delivery to the original purchaser occurred outside the continental United States). This warranty is extended only to the original purchaser ("Purchaser"). *Purchaser's sole and exclusive remedy is the repair and/or replacement of nonconforming goods as provided in the following paragraphs.*

In the event Purchaser believes the goods are defective, the goods must be returned to HFC, transportation prepaid by Purchaser, within twelve (12) months after delivery of goods (or eighteen (18) months for goods delivered outside the continental United States) for inspection by HFC. If HFC's inspection determines that the workmanship or materials are defective, the goods will be either repaired or replaced, at HFC's sole determination, free of additional charge, and the goods will be returned, transportation paid by HFC, using the lowest cost transportation available.

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HFC does not warrant these goods to meet the requirements of any safety code of any state, municipality, or any other jurisdiction, and purchaser assumes all risk and liability whatsoever resulting from the use thereof, whether used singly or in combination with other machines or apparatus.

This warranty shall not apply to any HFC goods or parts thereof, which have bee repaired outside HFC's factory or altered in any way, or have been subject to misuse, negligence, or accident, or have not been operated in accordance with HFC's printed instructions or have been operated under conditions more severe than, or otherwise exceeding, those set forth in the specifications for such goods.

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Disclaimer:
Specifications are subject to change without notice.
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MODEL ACC5A-101

GENERAL DESCRIPTION

The ACC5A is a test accessory used to verify operation of digital flow totalizers by generating a signal which simulates the output of the turbine flowmeter.

Once started, the ACC5A generates a pulse train output signal which produces either 10,000 or 100,000 pulses depending on that desired by the operator. This may be used to verify the proper operation of pulse scaling circuitry common to most digital flow totalizers.

In addition, the ACC5A has an amplitude select control which offers two output levels of 20 mVrms and 200 mVrms to simulate the output level of a magnetic pickup at low flow and high flow conditions.

To further increase the usefulness of this accessory, the frequency of the output signal may be varied to simulate the varying flowrate conditions which occur in real applications. A single turn dial is used to select a frequency of 100 to 1000 Hz.

The ACC5A is offered in a portable, hand-held case and contains an internal power source eliminating the need for conventional power. The output connector is the standard two pin configuration standard to nearly all turbine flowmeter magnetic pickups.

CONTROLS AND ADJUSTMENTS

POWER	A conventional power switch is provided for turning on ACC5A.
FREQUENCY	A single turn dial which allows the operator to select a frequency from 100 to 1000 Hz. Used to simulate rate of flow.
COUNT	A switch control which is used to select a burst of either 10,000 or 100,000 pulses. Used to verify proper operation of pulse scaling circuitry.
AMPLITUDE	A switch control which is used to select the amplitude of the output signal, used to simulate the amplitude at low flow and high flow conditions.
START	A momentary switch which is used to start the ACC5A by enabling a burst of the desired number of pulses.
RESET	A momentary switch which is used to manually stop and reset the output of the ACC5A. This allows the operator to cut short a test which apparently not producing the desired results in a unit under test.

SPECIFICATIONS

OUTPUT	Square Wave output waveform. Amplitude, frequency and number of pulses in output burst adjustable by user.
AMPLITUDE	20 mVrms and 200 mVrms available through switch selection.
FREQUENCY	100 to 1000 Hz (standard), adjustable through frequency control.
PRESET OUTPUT BURST	Either 10,000 not 100,000 pulses may be selected.
POWER	9 Vdc transistor battery.
EQUIPMENT ENCLOSURE	5¼ x 2¾ x 1 **e** ABS Plastic with aluminum panel.
CONNECTOR (OUTPUT)	MS3102A-10SL-4P.

BASIC TEST SETUP WHEN USING THE ACC5A

The following guide presents an overview of several possible applications where the ACC5A may be used to test turbine flowmeter based systems.

The basic setup for using the ACC5A requires that the flowmeter pickup coil signal be disconnected at the flowmeter and connected instead to the ACC5A output connector. The output connector corresponds to the industry standard for magnetic pickups in its physical configuration.

Once connected to the system to be tested, turn the power on the both the ACC5A and the unit to be tested. The ACC5A should then be reset by depressing the start and then the stop switch. Testing may then begin.

The procedure to be used will generally follow the guidelines given in the following examples. For detailed procedures for a specific model consult with the equipment manual for that item.

The Output Signal from the ACC5A may be setup to be one of two amplitudes, at any frequency between 100 and 1000 Hz and for a specified number of output pulses. The output signal is started by depressing the START switch, once started it will produce a burst of pulses until either stopped or when the PRESET number of pulses is delivered.

The ACC5A, once started produces a series of output pulses the number of which is determined by the PRESET setting. Two settings are available, being 10,000 and 100,000 pulses. After the desired number of pulses are produced the ACC5A turns off the pulse output signal. The time it takes to produce this number is a function of the FREQUENCY setting.

The frequency is variable from 100 to 1000 Hz depending on the setting of the FREQUENCY dial.

The amplitude of the output signal may be set to either 20 mV or 200 mVrms with the AMPLITUDE control.

The ACC5A is intended to function as a low cost troubleshooting aid to test turbine flowmeter based electronic systems. The POWER switch should be turned off when the ACC5A is not in use.

TESTING THE PULSE SCALING CIRCUITRY OF A DIGITAL TOTALIZER

Digital flow totalizers scale the pulsing input signal from a turbine flowmeter into a pulse counter display by effectively dividing by the number of pulses per unit volume the flowmeter produces. Referred to as the K-Factor, this number is given by the manufacturer of the turbine flowmeter and is used in the setup of all flow totalizers.

There are two means commonly employed to scale the flowmeter signal into the display of total flow in the desired units of measure. The first simply divides the number of input pulses by the programmed scaling constant. The second method multiplies the input pulse train by the scaling constant setting. For this later case this is a factor less than unity.

Regardless of the method of scaling used, the ACC5A may be used to verify that the scaling is being performed correctly. Once the ACC5A is started is produces a burst of either 10,000 or 100,000 pulses depending on PRESET setting. The lower setting may be used to increase the resolution of he resulting display.

A flow totalizer should therefore scale these pulses by the scaling factor and display that result when the ACC5A automatically turns off. The display which should result may be calculated with the aid of the following equations. Choose the equation type corresponding to the method of scaling used in the instrument. Note that in some systems there may be a cascade of a scaling factor and scaling factor multiplier. In most cases these two factors may be checked out independently as well as in cascade.

If unit scales the input signal by dividing by the scaling factor setting, use the following expression:

Total Display = Preset setting of ACC5A / Scaling Factor

If the unit scales the input signal by multiplying by the scaling factor setting, use the following expression:

Total Display = Preset Setting of ACC5A X Scaling Factor

When testing, first reset the total display, then start the ACC5A. When the totalizer stops counting the result should equal that calculated by the above equations.

USING THE ACC5A TO SETUP AND TEST FLOWRATE INDICATORS

Flowrate indicators scale the frequency signal of the turbine flowmeter which is linearly related to flowrate into a display of flowrate in the desired units of measure.

The ACC5A can generate a frequency from 100 to 1000 Hz during its output burst. The ACC5A may be used in conjunction with a frequency counter to test flow rate indicators.

To test a flowrate indicator set the output frequency of the ACC5A to a frequency corresponding to a know flowrate using a frequency counter for the measurement. The flowrate indicator reading should equal that flowrate expected. If not, recalibrate the flowrate indicator.

The linearity of the flowrate indicator may be tested by inputting several frequencies and verifying that the readings change proportionally.

USING THE ACC5A TO TEST SIGNAL CONVERTERS

Signal converters for turbine flowmeter convert the frequency of the turbine flowmeter into an analog voltage or current signal which is proportional to flowrate.

The same basic test setup used for testing flowrate indicators may be used for testing signal converters except that the analog output has to be monitored by a digital multimeter.

Once again the input signal conditioning, analog span, zero, and linearity may be tested using the ACC5A, multimeter and a frequency counter.

A COMPARISON BETWEEN THE ACC5 AND THE ACC5A

The ACC5 was an earlier version of a test accessory which has found widespread application in industry. A number of procedures have therefore been written around it.

To use the ACC5A in these applications place the PRESET in the 10K position, the amplitude in the 200mV position and he frequency in the minimum position. The ACC5A will then act like the ACC5.

As you become comfortable with its use try running your tests a the maximum frequency. You can see what a time saver this new unit is.

If you get a malfunctioning unit which works on the ACC5A but not on the flowmeter it may be that the signal conditioner card is not sensitive enough, you can verify this by testing at a 20 mV amplitude setting.

Did you ever want to see more resolution on the result of a test of the scaling factor? Try a test at maximum frequency with a preset of 100K. You will see a result with ten times the resolution in the same time as your old tests. You also can see how the display works at higher speeds.

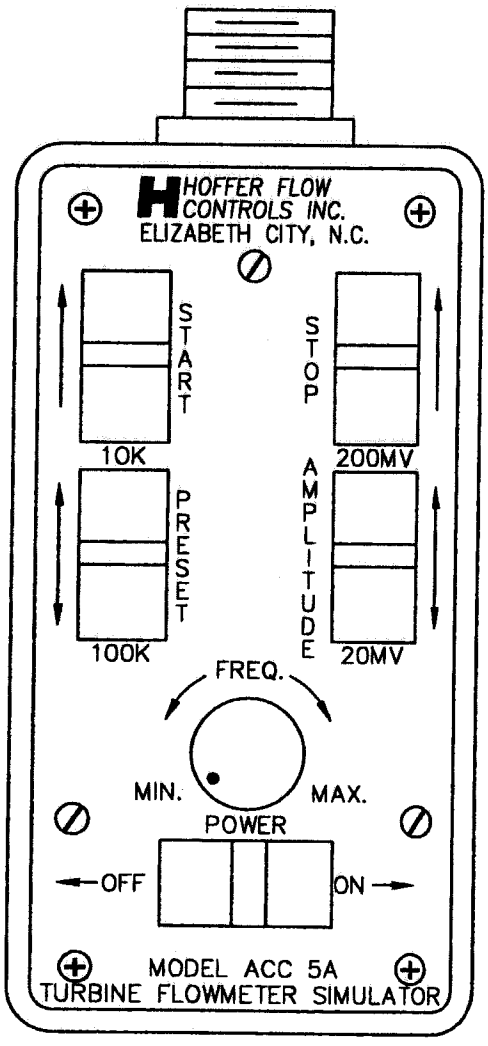
When your done don't forget to turn off the power switch. The battery inside is a 9 V transistor radio battery, this is something to think about changing if the ACC5A isn't working right.

Remember the ACC5A has battery, this means you will not have to run extension cords when testing anymore.

The ACC5 was more rugged than this new unit and bigger. Keep the ACC5A in a safe place.

Call with any questions that you might have. If someone from Hoffer is in your area ask him to demonstrate the new ACC5A for you and show you ways to help you meter checkouts faster and better.

REVISIONS			
REV	DESCRIPTION	DATE	APP
A	REVISED.	12/84	RG
B	DWG NO. WAS ACC5A-401. (CS)	951115	JD
C	DWG NO. WAS 700-0109	981117	



REPLACES 700-0109

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			CHECK RG	12/84	
		FINISH	QA		TITLE CONTROLS AND ADJUSTMENTS-ACC5A
			PROJ ENG		
NEXT ASSY	USED ON				
APPLICATION					

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES OTHER THAN RAW MATERIAL SHALL BE HELD AS FOLLOWS:

2 PLACE DECIMAL ±.01
3 PLACE DECIMAL ±.005
FRACTIONAL ±1/64
ANGULAR ±1/2°

SIZE	CAGE CODE	DWG NO	REV
A	33321	ACC5A-401	C

SCALE NONE | SHEET 1 OF 1